**Algebra 2 Trig.** **Chapter 6 Review** **Name** Key

**Solve the following equations and inequalities for x.**

1) $\frac{x}{4} = \frac{x+3}{x}$

$x^2 = 4x + 12$

$x^2 - 4x - 12 = 0$

$(x-6)(x+2) = 0$

$x = 6$ $x = -2$

2) $\sqrt[4]{x^4} = \sqrt[4]{20}$

$x = \pm 4.5$

3) $7^{x+5} = 7^{6x-3}$

$x + 5 = 6x - 3$

$\frac{8}{5} = \frac{5x}{5}$

$1.6 = x$

4) $3 + (3x-1)^2 = 28$

$\sqrt{(3x-1)^2} = \sqrt{25}$

$3x - 1 = 5 \quad -5$

$+1 \quad +1 \quad +1$

$\frac{3x}{3} = \frac{6}{3} \quad -\frac{4}{3}$

$x = 2$ and $-4/3$

5) $2\sqrt{x+8} - 1 = -3 + 7$

$2\sqrt{x+8} = 4$

$(\sqrt{x+8})^2 = 2^2$

$x + 8 = 4$

$x = -4$

6) $3 + |2x - 5| \le 18$

$|2x - 5| \le 15$

$-15 \le 2x - 5 \le 15$

$+5 \quad +5 \quad +5$

$\frac{-10}{2} \le \frac{2x}{2} \le \frac{20}{2}$

$-5 \le x \le 10$

7) $\log_x 81 = 4$

$x^4 = 81$

$3^4 = 81$

$x = 3$

8) $\log_7 1 = x$

$7^x = 1$

$7^0 = 1$

$x = 0$

9) $-2 = \log_5 x$

$5^{-2} = x$

$\frac{1}{5^2}$

$\frac{1}{25} = x$

**Evaluate.**

10) $\log_7 343$

$\frac{\log 343}{\log 7}$

3

11) $\log_4 1024$

$\frac{\log 1024}{\log 4}$

5

12) $\log_5 5^7$

$\frac{\log 5^7}{\log 5}$

7

13) $\log_5 \frac{1}{125}$

$\frac{\log 1/125 = 5^3}{\log 5}$

$-3$

14) $\log_{13} 13^x$

$\frac{\log 13^x}{\log 13}$

$x$

**Write in exponential form.** $b^x = a \rightarrow \log_b a = x$

15) $\log_4 16 = 2$

$4^2 = 16$

16) $\log_x 13 = 5$

$x^5 = 13$

17) $x = \log_b y$

$b^x = y$

**Give the inverse of each of these equations.** Solve for x, switch x & y

18) $y = 4x - 28$

$\frac{y+28}{4} = x$

inverse $y = \frac{x+28}{4}$

19) $y = \frac{2}{5}x - 4$

$+4 \quad +4$

$\frac{5}{2}(y+4) = (\frac{2}{5}x)\frac{5}{2}$

$\frac{5}{2}(x+4) = y$

20) $y = \log_5(x-2)$

$5^y = x - 2$

$+2 \quad +2$

$5^y + 2 = x$

$5^x + 2 = y$

21) $y = 3^{x+5}$

$\log_3(y) = \log_3 3^{x+5}$

$\log_3(y) = x + 5$

$\log_3(y) - 5 = x$

$y = \log_3(x) - 5$

**Use the following formula to answer the following questions.**

$$A(t) = P\left(1 + \frac{r}{n}\right)^{nt}$$

Find the final amount on 22 and 23.

22) $18,000 earning 4% interest compounded monthly for 15 years. $n = 12$ $20,912

$A = 18000\left(1 + \frac{.04}{12}\right)^{12 \cdot 15}$

$18000(1.00333)^{180}$

23) $14,500 earning 8% compounded annually for 19 years. $62,578

$A = 14,500\,(1.08)^{19}$

$A =$

24) How much would you need to deposit into an account that pays 5% interest compounded quarterly in order to have $45,000 after 15 years. (Round to the nearest dollar.) P

$45000 = P\left(1 + \frac{.05}{4}\right)^{4 \cdot 15}$

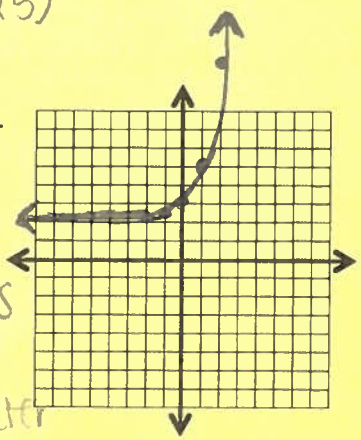
$45000 = P(1.0125)^{60}$

$\frac{45000}{(1.0125)^{60}} = P$

$21,356

**Make a table and graph the following.**

25) $y = (3)^x + 2$



| x | y |
|---|---|
| -2 | 2.11 |
| -1 | 2.3 |
| 0 | 3 |
| 1 | 5 |
| 2 | 11 |

Domain $\mathbb{R}$, all real numbers

$-\infty \leq x \leq \infty$

Range $y > 2$, any # greater than 2

If the graph was moved up 7 units, what would the new equation be? $y = 3^x + 9$